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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MATTHEW J. DAVIS, QI DAI, HAUNN-LIN TONY CHEN, and MATTHEW TAYLOR[1]

Appeal 2016-001124
Application 13/343,962
Technology Center 1700

Before CHUNG K. PAK, JEFFREY T. SMITH, and WESLEY B. DERRICK, *Administrative Patent Judges*.

DERRICK, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134(a) from the Examiner's maintained final rejection of claims 1–23.[2] We have jurisdiction pursuant to 35 U.S.C. § 6(b).

We AFFIRM.

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[1] According to Appellants, the Real Party in Interest is Cytec Technology Corp. Appeal Brief filed February 26, 2015 ("App. Br."), 2.

[2] Final Office Action entered March 28, 2014 ("Final Act."), 2.

CLAIMED SUBJECT MATTER

Appellants' claimed invention is generally directed to reducing the levels of suspended solids in the process stream of a process for producing alumina by digestion of bauxite ore by the use of a silicon-containing polymer as a flocculant. Spec. Abstract; Claim 1.

Claim 1 is illustrative:

> 1. A flocculation method, comprising:
>
> intermixing a silicon-containing polymer flocculant with a process stream from a process to digest bauxite ore in an amount effective to thereby flocculate at least a portion of the suspended solids therein, wherein the suspended solids are selected from the group consisting of calcium aluminosilicate, calcium silicate, calcium titanate and titanium dioxide; and
>
> separating at least a portion of the flocculated suspended solids thus formed.

App. Br. 9, Claims Appendix.

REJECTION

The Examiner maintains the final rejection of claims 1–23 under 35 U.S.C. § 103(a) as obvious over Cole (US 5,601,726, issued February 11, 1997) ("Cole") in view of Sivakumar et al. (US 5,679,261, issued October 21, 1997) ("Sivakumar"), Spitzer et al. (US 6,814,873 B2, issued November 9, 2004) ("Spitzer"), and Quadir et al. (US 6,527,959 B1, issued March 4, 2003) ("Quadir").[3]

[3] Final Act. 2–5; Examiner's Answer entered August 21, 2015 ("Ans.").

DISCUSSION

Having reviewed the Examiner's rejection in light of the arguments advanced by Appellants in their Appeal Brief, we are not persuaded that the Examiner errs reversibly in concluding that claims 1–23 are unpatentable for obviousness. We add the following for emphasis.

Claims 1 and 6–8

Appellants argue claims 1 and 6–8 as a group on the basis of claim 1, to which we limit our discussion. App. Br. 2–6.

Cole discloses manufacturing alumina from raw bauxite via the Bayer process. Cole col. 1, ll. 10–11, 25–28. The Examiner finds that Cole discloses that the alumina manufacturing process includes adding an effective amount of a flocculant composition to a Bayer process stream to flocculate a portion of solids suspended in the stream, followed by separating out the flocculated, suspended solids. Final Act. 2; Cole col. 3, ll. 34–43. Cole discloses that the flocculant composition can be added to a stream fed to a primary settler (known as the digester blow-off) and/or to a stream fed to the initial stages of a washer train. Cole col. 3, ll. 17–26. The Examiner acknowledges that Cole does not disclose that the flocculant composition includes a silicon-containing polymer flocculant, and also does not disclose that the suspended solids include calcium aluminosilicate, calcium silicate, calcium titanate, or titanium dioxide. Final Act. 2. To address these aspects of the claimed method missing from Cole's disclosure, the Examiner relies on Sivakumar's disclosure of utilizing a silicon-containing polymer coagulant or flocculant in combination with an anionic flocculant to remove turbidity from waste water. Final Act. 2; Sivakumar

col. 3, ll. 16–21; col. 5, ll. 27–30. The Examiner further relies on Spitzer's disclosure of adding a silicon-containing polymer to a Bayer process stream to inhibit or reduce aluminosilicate scale formation on the walls of heat exchangers. Final Act. 2–3; Spitzer col. 3, l. 59–col. 4, l. 26. The Examiner finds that Spitzer discloses adding the same concentration of a silicon-containing polymer to a Bayer process stream as claimed by Appellants. Final Act. 3; Spitzer col. 7, l. 60–col. 8, l. 6. The Examiner further relies on Quadir's disclosure of using a flocculent during the Bayer process to separate solids (referred to a "red mud solids"), such as calcium titanates, from aluminate liquor in a primary settler. Final Act. 3; Quadir col. 2, ll. 20–34.

Based on the above findings, the Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time of Appellants' invention to add a silicon-containing polymer as disclosed in Spitzer to a Bayer process stream as disclosed in both Cole and Spitzer to prevent aluminosilicate scale formation, as taught by Spitzer. Final Act. 3; Ans. 3–4. The Examiner finds that although Spitzer does not explicitly disclose that the silicon-containing polymer would act as a flocculent when added to the Bayer process stream, a silicon-containing polymer would inherently have this property, as evidenced by Sivakumar's disclosure that silicon containing polymers have flocculation properties. Ans. 3–4. The Examiner finds that adding a silicon-containing polymer to a Bayer process stream would therefore remove solids suspended in the stream, such as calcium titanates as disclosed by Quadir. Ans. 5–6.

Appellants argue that the combined disclosures of Cole, Sivakumar, and Spitzer fail to teach or suggest a method of using a silicon-containing

polymer in the Bayer process to flocculate calcium aluminosilicate, calcium silicate, calcium titanate, and titanium dioxide because Cole teaches that different polymer flocculants are used to remove different solids at different stages in the Bayer process. App. Br. 3, 5. Appellants also contend that Sivakumar admits that just because a polymer flocculent works in one environment, such as oily wastewater, does not mean it will work in another environment, such as wastewater from paper mills, and relies on this in arguing it would not have been obvious to one of ordinary skill in the art at the time of the invention to use Sivakumar's silicon-containing polymers as a flocculant in the Bayer process. App. Br. 3–5. Appellants further contend that although Spitzer discloses that silicon-containing polymers prevent aluminosilicate scale in heat exchangers used in the Bayer process, Spitzer does not teach or suggest that the scale inhibitors would also function as flocculants for suspended solids of a chemistry different from aluminosilicates in a different stage of the Bayer process. App. Br. 4–5.

However, Spitzer discloses a silicon-containing polymer as recited in claim 1, and further discloses adding the silicon-containing polymer to a Bayer process stream, which is a solution generated in a process for manufacturing alumina from bauxite ore, as also recited in claim 1. Spitzer col. 1, ll. 7–10; col. 4, ll. 9–26. Spitzer discloses that "the polymer can be added to the Bayer process stream at any time during the process" (Spitzer col. 8, ll. 10–11), and Appellants' Specification similarly indicates that a flocculating silicon-containing polymer can be added to a process stream at any stage of the Bayer process. Spec. ¶ 16. Although Spitzer does not explicitly indicate that the silicon-containing polymer acts as a flocculant when added to a Bayer process stream, the Examiner correctly finds that the

silicon-containing polymer necessarily or inherently has this property because it has the same structure, and is added to the same Bayer process stream at the same stage (any stage), as the silicon-containing polymer recited in claim 1. Ans. 3–4. *In re Papesch*, 315 F.2d 381, 391 (CCPA 1963) ("a compound and all of its properties are inseparable"); *In re Spada*, 911 F.2d 705, 709 (Fed. Cir. 1990) (explaining that a chemical composition and its properties are inseparable.); *Ex parte Obiaya*, 227 USPQ 58, 60 (BPAI 1985) ("The fact that appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious.")

Appellants do not dispute the Examiner's finding that Spitzer discloses adding the same concentration of a silicon-containing polymer as claimed to a Bayer process stream. *Compare* Final Act. 3, *with* App. Br. 2–6. Moreover, claim 1 does not require the silicon-containing polymer to exhibit a particular level of flocculation, and recites only that the silicon-containing polymer is effective to flocculate at least a portion of suspended solids. Thus, Appellants' argument that Spitzer does not teach or suggest that the silicon-containing polymer scale inhibitor would also function as a flocculant for suspended solids of a chemistry different from aluminosilicates in a different stage of the Bayer process (App. Br. 4–5) does not demonstrate that the silicon-containing polymer disclosed in Spitzer would not function to flocculate at least a portion of suspended solids when added to a Bayer process stream at any stage of the Bayer process, as recited in claim 1.

In addition, Appellants' argument that Cole teaches using different polymer flocculants to remove different solids at different stages in the Bayer process (App. Br. 3) is undermined by the teaching in Appellants' Specification that a flocculating silicon-containing polymer can be added to a process stream at any stage of the Bayer process (discussed above).

As to Appellants' contention that Sivakumar admits that polymer flocculants effective for oily wastewater will not necessarily work in wastewater from paper mills is not supported by Sivakumar's disclosures. App. Br. 3–4. The disclosures in Sivakumar cited by Appellants discuss the differences between wastewater clarification, the subject of Sivakumar's invention, and prior art methods for treatment of oily wastewater by emulsion breaking. Sivakumar col. 2, l. 47–col. 3, l. 12. Sivakumar indicates that "more efficient processes for the removal of turbidity in wastewater clarification would represent an improvement over the prior art [emulsion breaking process]." Sivakumar col. 3, ll. 3–5. Contrary to Appellants' arguments, the relied-upon disclosures in Sivakumar do not indicate that polymer flocculants used to treat oily wastewater by emulsion breaking would not be effective at wastewater clarification, including clarification of wastewater from effluent streams of paper mills, but indicate only that more efficient wastewater clarification processes would be an improvement over the prior art emulsion breaking process. *Cf. DyStar Textilfarben Gmbh & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1364 (Fed. Cir. 2006) ("We will not read into a reference a teaching away from a process where no such language exists.").

Appellants also argue that Quadir discloses using salicylic acid-containing polymers to remove calcium titanate from red mud in the Bayer

process, and Appellants contend that one skilled in the art, considering Quadir together with Cole, Sivakumar and Spitzer, would have been led to use a salicylic acid containing polymer to flocculate the solids recited in claim 1 from a Bayer process stream, rather than a silicon-containing polymer. App. Br. 5. However, we agree with the Examiner that because the Bayer process stream disclosed in Spitzer is the same process stream as recited in claim 1, Spitzer's process stream would inherently include the suspended solids recited in claim 1, as evidenced by Quadir's disclosure of a Bayer process stream containing calcium titanate. Ans. 5–7. Accordingly, the silicon-containing polymer disclosed in Spitzer would flocculate at least a portion of solids present in a Bayer process stream, such as those recited in claim 1, when added at any stage of the Bayer process, as discussed above. Appellants' arguments regarding Quadir are therefore unpersuasive of reversible error.

Claims 9–23

Appellants argue that the experimental Examples included in their Specification illustrate that "the combination of a silicon-containing polymer flocculant for a desilication product and a polymer flocculant for a Bayer process red mud act synergistically to improve both settling rate and clarity of desilication product/red mud mixtures." App. Br. 6. However, Appellants' skeletal argument does not explain the asserted synergy with particularity, and Appellants' do not direct us to any specific data or experimental Examples in their Specification. Accordingly, Appellants' assertion does not constitute a substantive argument articulating why and

how the experimental Examples included in their Specification rebut the Examiner's case of prima facie obviousness.

Claims 2–5 and 13–16

Appellants rely in essence on the same arguments advanced in connection with claim 1 discussed above for claims 2–5 and 13–16. App. Br. 6. Because we are unpersuaded of reversible error in the Examiner's rejection of claim 1, Appellants' position as to claims 2–5 and 13–16 is equally without merit.

DECISION

In view of the foregoing, the Examiner's rejection of claims 1–23 under 35 U.S.C. § 103(a) is AFFIRMED.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1).

AFFIRMED